

**Sarung tangan pelindung terhadap bahan kimia
berbahaya dan mikroorganisme – Bagian 1:
Terminologi dan persyaratan kinerja terhadap risiko
bahan kimia**

(ISO 374-1:2016, IDT, Eng)

© ISO 2016 – All rights reserved

© BSN 2020 untuk kepentingan adopsi standar © ISO menjadi SNI - Semua hak dilindungi

Hak cipta dilindungi undang-undang. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh isi dokumen ini dengan cara dan dalam bentuk apapun serta dilarang mendistribusikan dokumen ini baik secara elektronik maupun tercetak tanpa izin tertulis dari BSN

BSN

Email: dokinfo@bsn.go.id

www.bsn.go.id

Diterbitkan di Jakarta

Daftar isi

Daftar isi	i
Prakata	ii
1 Scope	1
2 Normative reference	1
3 Term and definition	1
4 Sampling.....	2
5 Performance requirements.....	3
6 Marking	6
7 Information supplied by the manufacturer	7
 Figure 1 — Additional sample location for gloves longer than 400 mm	3
Figure 2 — Marking of Type A gloves	6
Figure 3 — Marking of Type B gloves	7
Figure 4 — Marking of Type C gloves	7
 Table 1 — Permeation performance levels	4
Table 2 — List of test chemicals	5
Table 3 — Requirements for different protection types of gloves	6

Prakata

Standar Nasional Indonesia (SNI) ISO 374-1:2016, dengan judul *Sarung tangan pelindung terhadap bahan kimia berbahaya dan mikroorganisme – Bagian 1: Terminologi dan persyaratan kinerja terhadap risiko bahan kimia (ISO 374-1:2016, IDT, Eng)*, merupakan hasil adopsi identik dari standar ISO 374-1:2016 *Protective gloves against dangerous chemicals and micro-organisms — Part 1: Terminology and performance requirements for chemical risks*, dengan metode republikasi *reprint*, yang ditetapkan oleh BSN pada tahun 2020.

Standar ini disusun oleh Komite Teknis 13-09 Biosafety and Biosecurity dengan Badan Standardisasi Nasional (BSN) sebagai sekretariat Komite Teknis. Standar ini telah dibahas dalam rapat teknis, dan terakhir disepakati dalam rapat konsensus di Jakarta pada tanggal 17 April 2020 yang dihadiri oleh para pemangku kepentingan (*stakeholder*) terkait, yaitu perwakilan dari produsen, konsumen, pakar dan pemerintah, serta perwakilan dari lembaga penguji, asosiasi, perguruan tinggi, pakar serta instansi terkait.

Standar ini telah melalui tahap jajak pendapat pada tanggal 11 Mei 2020 sampai dengan 30 Mei 2020 dengan hasil akhir disetujui menjadi SNI.

Apabila di kemudian hari pengguna menemukan kesulitan dalam penggunaan standar ini, maka dianjurkan untuk merujuk pada standar aslinya yaitu ISO 374-1:2016 dan/atau dokumen terkait lain yang menyertainya.

Perlu diperhatikan bahwa kemungkinan beberapa unsur dari dokumen standar ini dapat berupa hak paten. Badan Standardisasi Nasional tidak bertanggungjawab untuk pengidentifikasian salah satu atau seluruh hak paten yang ada.

Sarung tangan pelindung terhadap bahan kimia berbahaya dan mikroorganisme – Bagian 1: Terminologi dan persyaratan kinerja terhadap risiko bahan kimia

1 Scope

This part of ISO 374 specifies the requirements for protective gloves intended to protect the user against dangerous chemicals and defines terms to be used.

NOTE If other protection features have to be covered, e.g. mechanical risks, thermal risks, electrostatic dissipation etc., the appropriate specific performance standard is to be used in addition. Further information on protective gloves standards can be found in the EN 420.

2 Normative reference

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 374-2:2014, *Protective gloves against dangerous chemicals and micro-organisms — Part 2: Determination of resistance to penetration*

EN 374-4:2013, *Protective gloves against chemicals and micro-organisms — Part 4: Determination of resistance to degradation by chemicals*

EN 420:2009, *Protective gloves — General requirements and test methods*

EN 16523-1:2015, *Determination of material resistance to permeation by chemicals — Part 1: Permeation by liquid chemical under conditions of continuous contact*

3 Term and definition

For the purposes of this document, the terms and definitions in EN 16523-1 and the following apply.

3.1

dangerous chemicals

chemical substance potentially hazardous for the health (carcinogenic, mutagenic, reprotoxic, toxic, harmful, corrosive, irritant, sensitizing), as defined in any national regulation

Note 1 to entry The former European Directives 1999/45/EC and 67/548/EEC have been repealed by regulation 1272/2008 on classification, labeling and packaging of substances and mixtures.

3.2

protective glove material

any material or combination of materials used in a protective glove for the purpose of isolating the hands or hands and arms from direct contact with a dangerous chemical

3.3

protective gloves against dangerous chemical risks

protective gloves which form a protective barrier to *dangerous chemicals* (3.1)

3.4

degradation

deleterious change in one or more properties of a *protective glove material* (3.2) due to contact with a chemical

Note 1 to entry Indications of degradation may include flaking, swelling, disintegration, embrittlement, colour change, dimensional change, appearance, hardening, softening, etc.

3.5

penetration

movement of a chemical through materials, seams, pinholes, or other imperfections in a *protective glove material* (3.2) on a non-molecular level

3.6

permeation

process by which a chemical moves through a *protective glove material* (3.2) on a molecular level

Note 1 to entry Permeation involves the following:

- absorption of molecules of the chemical into the contacted (outside) surface of a material;
- diffusion of the absorbed molecules in the material;
- desorption of the molecules from the opposite (inside) surface of the material.

3.7

test chemical

chemical substance, or mixture of chemical substances, potentially hazardous to the health that is used under laboratory test conditions to determine the breakthrough time

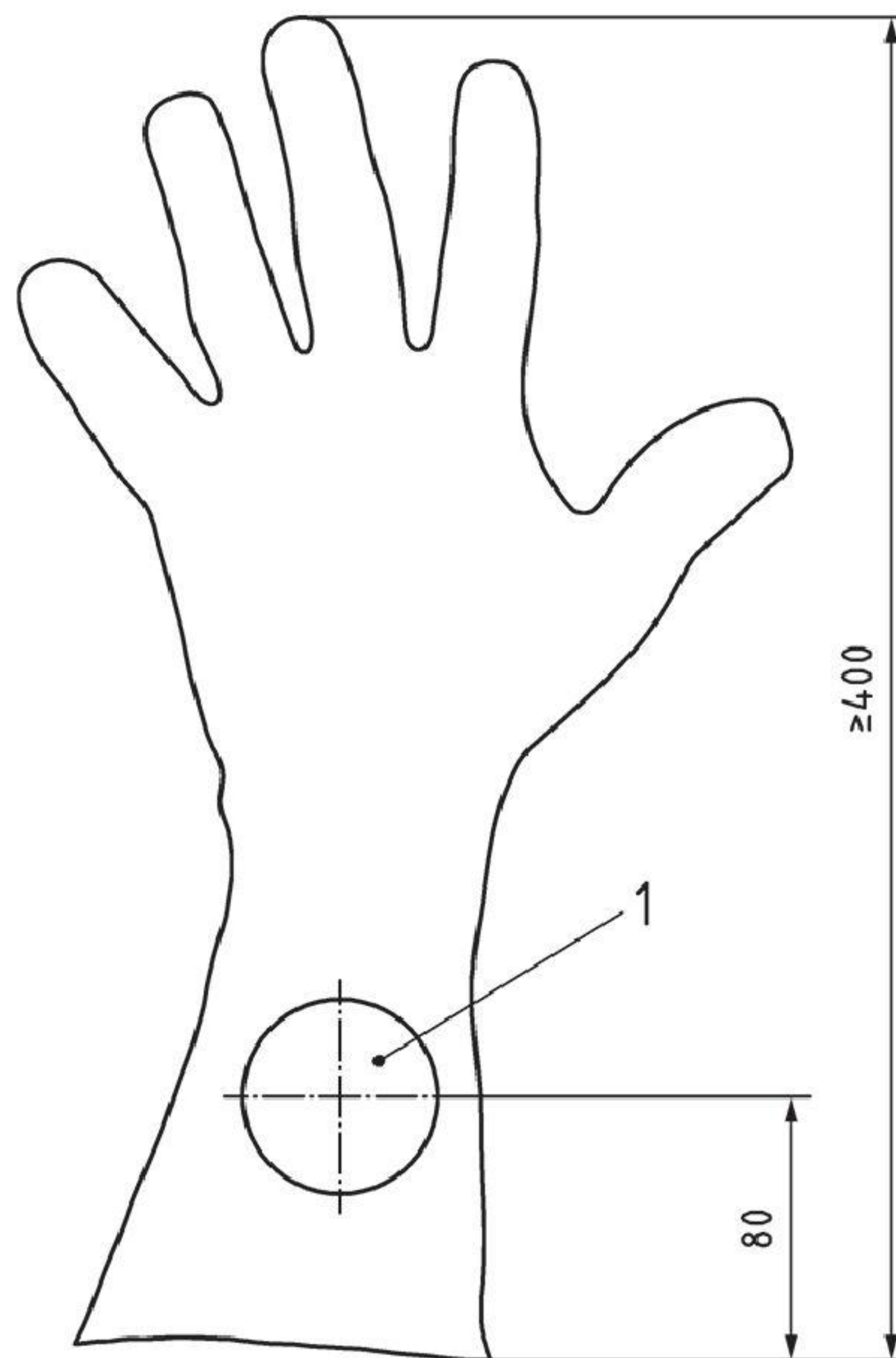
4 Sampling

4.1 Sampling for permeation

Each material specimen to be tested shall conform to the requirement in EN 16523-1:2015, Clause 7, so that the material can be sealed inside the test cell.

Three test specimens shall be taken from the palm area. If the glove is longer than or equal to 400 mm and if the cuff is claimed to protect against chemical risks, three additional test specimens shall be taken where the center is 80 mm from the end of the cuff (see Figure 1).

Dimensions in millimetres

**Key**

1 Sample

Figure 1 — Additional sample location for gloves longer than 400 mm

Other parts of the glove can be tested on request. In the case of seams in the hand area, this area shall be tested. For multilayer chemical protective gloves, in the case of layers not bonded to the chemical protective layer, the layers not claiming any effect on the chemical protection can be removed, i.e. thermal insulation layer.

4.2 Sampling for penetration testing

The sampling for penetrations shall be done according to EN 374-2:2014, Clause 5.

4.3 Sampling for degradation testing

The sampling for degradation shall be done according to 4.1 and EN 374-4:2013, 5.1.

5 Performance requirements

SAFETY PRECAUTION — Persons using this part of ISO 374 shall be familiar with normal laboratory practice. This part of ISO 374 does not purport to address all the safety problems, if any, associated with its use. It is the responsibility of the user to apply established Health and Safety practices and to ensure compliance with European or national regulatory conditions.

5.1 General requirements

Protective gloves against dangerous chemicals shall comply with the requirements given in EN 420:2009, Clause 4, Clause 5 and Clause 7.

5.2 Penetration

Protective gloves shall not leak when tested according to EN 374-2:2014, 7.2 and 7.3.

5.3 Degradation

The degradation (DR) shall be determined according to EN 374-4 for each chemical claimed in the marking and reported in the user instruction.

For the glove longer than 400 mm, the degradation corresponding to the lowest permeation results shall at least be reported.

5.4 Permeation

5.4.1 General

For the glove longer than 400 mm, where the palm and cuff achieve different performance levels, the lowest performance level shall be claimed in the marking for each chemical.

All the results should be reported in the user instruction.

Each combination of protective glove/test chemical shall be classified according to Table 1, using the results as given in EN 16523-1:2015, 8.5.1.1 or 8.5.1.3 for the normalized breakthrough time.

Table 1 — Permeation performance levels

Measured breakthrough time min	Permeation performance level
>10	1
>30	2
>60	3
>120	4
>240	5
>480	6

The test chemical(s) shall be taken from the list of test chemicals in Table 2. Other test chemicals could be used depending on the application of the gloves.

The situation described in EN 16523-1:2015, 8.5.1.4 is considered a fail due to non-homogeneity of the samples.

According to their permeation performance, chemical protective gloves are classified into three types: type A, type B or type C.

5.4.2 Type A

The permeation performance shall be at least level 2 against a minimum of six test chemicals listed in Table 2.

5.4.3 Type B

The permeation performance shall be at least level 2 against minimum of three test chemicals listed in Table 2.

5.4.4 Type C

The permeation performance shall be at least level 1 against minimum of one test chemical listed in Table 2.

Table 2 — List of test chemicals

CODE LETTER	CHEMICAL	CAS NUMBER	CLASS
A	Methanol	67-56-1	Primary alcohol
B	Acetone	67-64-1	Ketone
C	Acetonitrile	75-05-8	Nitrile compound
D	Dichloromethane	75-09-2	Chlorinated hydrocarbon
E	Carbon disulphide	75-15-0	Sulphur containing organic compound
F	Toluene	108-88-3	Aromatic hydrocarbon
G	Diethylamine	109-89-7	Amine
H	Tetrahydrofuran	109-99-9	Heterocyclic and ether compound
I	Ethyl acetate	141-78-6	Ester
J	n-Heptane	142-82-5	Saturated hydrocarbon
K	Sodium hydroxide 40 %	1310-73-2	Inorganic base
L	Sulphuric acid 96 %	7664-93-9	Inorganic mineral acid, oxidizing
M	Nitric acid 65 %	7697-37-2	Inorganic mineral acid, oxidizing
N	Acetic acid 99 %	64-19-7	Organic acid
O	Ammonium hydroxide 25 %	1336-21-6	Organic base
P	Hydrogen peroxide 30 %	7722-84-1	Peroxide
S	Hydrofluoric acid 40 %	7664-39-3	Inorganic mineral acid
T	Formaldehyde 37 %	50-00-0	Aldehyde

5.5 Requirements for gloves types A, B and C

The requirements are mentioned in Table 3.

Table 3 — Requirements for different protection types of gloves

	<u>5.1</u>	<u>5.2</u>	<u>5.4.2</u>	<u>5.4.3</u>	<u>5.4.4</u>
Type A	X	X	X		
Type B	X	X		X	
Type C	X	X			X
X = required.					

6 Marking

Protective gloves against dangerous chemicals shall be marked in accordance with the requirements for protective gloves in EN 420 and with the following.

6.1 Marking of Type A gloves

For protective gloves complying with the type A requirements stated in 5.5, the pictograms in Figure 2 shall be used with reference to this part of ISO 374.

The six tested chemicals shall be identified by their code letter which shall be marked under the pictogram as shown in Figure 2. If other chemicals not present in the list have been tested, information about the performance levels shall be provided in the user instructions

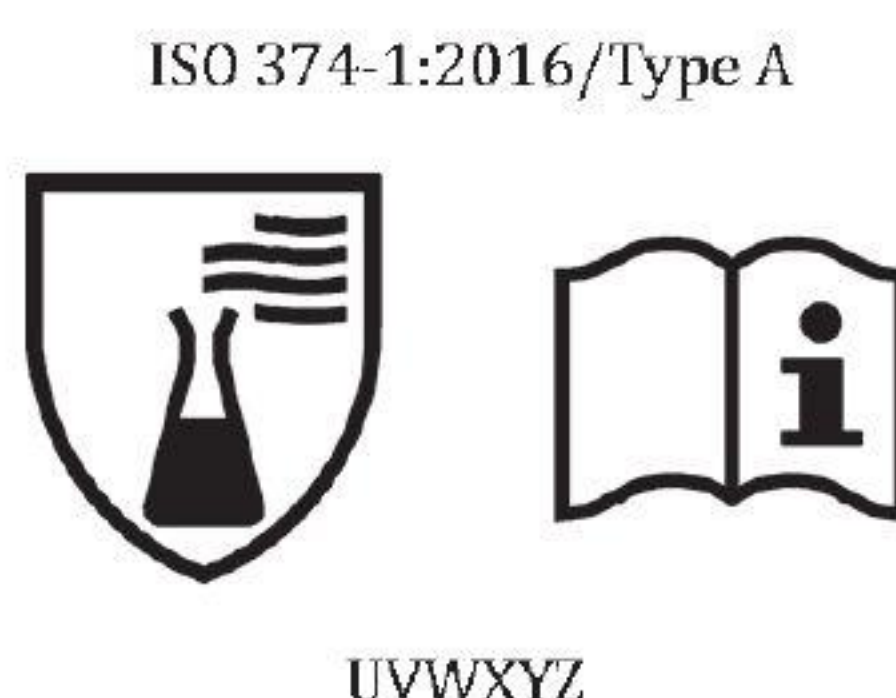


Figure 2 — Marking of Type A gloves

6.2 Marking of Type B gloves

For protective gloves complying with the type B requirements stated in 5.5, the pictograms in Figure 3 shall be used with reference to this part of ISO 374.

The three tested chemicals shall be identified by their code letter which shall be marked under the pictogram as shown in Figure 3. If other chemicals not present in the list have been tested, information about the performance levels shall be provided in the user instructions

ISO 374-1:2016/Type B



XYZ

Figure 3 — Marking of Type B gloves

6.3 Marking of Type C gloves

For protective gloves complying with the type C requirements stated in 5.5, the pictogram in Figure 4 shall be used and the reference to this part of ISO 374.

The tested chemical shall be identified by its code letter which shall be marked under the pictogram as shown in Figure 4. If other chemicals not present in the list have been tested, information about the performance levels shall be provided in the user instructions

ISO 374-1:2016/Type C



Figure 4 — Marking of Type C gloves

7 Information supplied by the manufacturer

The information supplied by the manufacturer shall be in accordance with the requirements for information as defined in EN 420. It shall also include the results of 5.2, 5.3, 5.4, the list of all the chemicals to which the protective gloves have been tested and the performance levels obtained in permeation testing.

The following warnings shall be added in the user instructions:

“This information does not reflect the actual duration of protection in the workplace and the differentiation between mixtures and pure chemicals.”

“The chemical resistance has been assessed under laboratory conditions from samples taken from the palm only (except in cases where the glove is equal to or over 400 mm - where the cuff is tested also) and relates only to the chemical tested. It can be different if the chemical is used in a mixture.”

“It is recommended to check that the gloves are suitable for the intended use because the conditions at the workplace may differ from the type test depending on temperature, abrasion and degradation.”

“When used, protective gloves may provide less resistance to the dangerous chemical due to changes in physical properties. Movements, snagging, rubbing, degradation

caused by the chemical contact etc. may reduce the actual use time significantly. For corrosive chemicals, degradation can be the most important factor to consider in selection of chemical resistant gloves”

“Before usage, inspect the gloves for any defect or imperfections.”

For reusable gloves, the manufacturer shall provide the relevant instructions for decontamination.

If there is no information about decontamination, then it is intended for single use only and the following warning shall be added: “For single use only”.

Informasi pendukung terkait perumus standar

[1] Komite Teknis

Komite Teknis 13-09 Biosafety and Biosecurity

[2] Susunan Keanggotaan Komite Teknis

Ketua	:	Sunarya	- The Spring Institute
Sekretaris	:	Agus Purnawarman	- Badan Standardisasi Nasional
Anggota	:	1. Diah Iskandriati	- Pusat Studi Satwa Primata, Lembaga Penelitian dan Pengabdian kepada Masyarakat, IPB University
	:	2. Syafril Daulay	- Komisi Ahli, Badan Karantina Pertanian Kementerian Pertanian
	:	3. Ni Ketut Susilarini	- Pusat Penelitian dan Pengembangan Biomedis dan Teknologi Dasar Kesehatan, Badan Litbangkes, Kementerian Kesehatan
	:	4. Indrawati Sendow	- Balai Besar Penelitian Veteriner
	:	5. Lilyana Budihardjo	- PT.Gaia Science Indonesia
	:	6. Rika R.Sjoekri	- CV.Noesis
	:	7. Arnold Sudharyanto	- PT.Trisakti Mekarmandiri
	:	8. Wanny Basuki	- World BioHazTech Pte. Ltd.
	:	9. Ni Made Ria Isriyanthi	- Subdit Pengawasan Obat Hewan, Direktorat Kesehatan Hewan Direktorat Peternakan dan Kesehatan Hewan. Kementerian Pertanian
	:	10. Aroem Naroeni	- Pusat Riset Virologi (PRVKP), Fakultas Kedokteran Universitas Indonesia
	:	11. Nuryani Zainuddin	- Balai Besar Karantina Pertanian Soekarno Hatta, Badan Karantina Pertanian, Kementerian Pertanian

[3] Konseptor

Gugus Kerja Komtek 13-09

[4] Sekretariat Pengelola Komite Teknis

Direktorat Pengembangan Standar Agro, Kimia, Kesehatan dan Halal
Badan Standardisasi Nasional